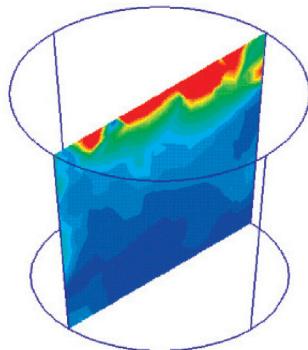


# ITI Provides Quick Fix for Fast Food

Through the work that ProEng carries out, companies gain a much greater understanding of how to develop tastier, healthier and more efficient microwave meals. CADfix's role in this process is vital to providing an important technical analysis on this entire development process.



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Microwave product simulation

## CADfix

CADfix removes barriers preventing the reuse of solid models. By providing an extensive set of geometry manipulation tools for importing, repairing and exporting data, CADfix maximizes the reuse of CAD data in downstream applications.

Ready meals are becoming increasingly popular. The problem is that after a five-minute burst in the microwave, very rarely does your meal come out piping hot and looking like the product that was advertised. A typical scenario is a dish that is either burnt or cold. However there is good news.

Companies today are taking the ready meal market very seriously. The science and technology behind it is extremely complex, and for an industry worth billions, those producing ready meals are prepared to pay for perfection.

### The industry

Recent figures show that ready meals are one of the highest growth sectors in the food market. New product technologies and new options are increasing in importance. In addition, a variety of social changes have continued to drive the market forward, with people's increasingly busy lifestyles being a key factor for ready-meal purchases.

For companies hoping to make millions on ready meals, they must perfect a meal that not only looks good on the shelf but also tastes great when reheated. To get this winning combination for improved quality, companies often require specialized technical help.

### ProEng Solutions

ProEng Solutions specializes in product and process engineering projects for the food industry. One of its areas of expertise is in the field of microwavable products.

ProEng Solutions often works with companies that develop microwavable ready-meal and snack products that will

reheat optimally without burning or leaving cold spots. The problem these companies face is using packaging that has consumer appeal and will also ensure that the product reheats effectively and delivers on visual appeal, taste and texture.

Managing Director of ProEng Solutions, Dr Sidi Chouikhi explains, "Ready meals need to be carefully targeted to appeal to and match the needs and expectations of consumers. This creates conflicts in terms of packaging design between the requirements for consumer appeal and those for effective microwave reheating. Companies will select packaging that will catch customers' eyes, but often this packaging will not aid the microwave reheating of the product, leaving consumers disappointed with their meals."

### CADfix CAE

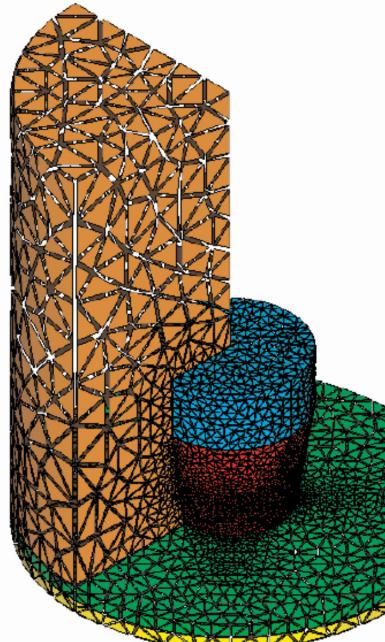
One of the company's key tools in its problem solving process is the leading data interoperability solution, CADfix. CADfix tackles fundamental inconsistencies and inaccuracies that make the efficient transfer of solid modeling geometry between different CAD systems and downstream applications, such as finite element analysis (FEA), all but impossible.

ProEng employs a specific version of CADfix, called CADfix CAE, designed especially for CAE users. CADfix CAE is used in the analysis of food processes for microwave-reheat performance on products, particularly ready meals. Factors that have to be considered when looking at microwavable products include its safety and quality requirements, flavor, taste, functionality and texture.



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# ITI Provides Quick Fix for Fast Food



Microwave interior mesh

## About ITI

ITI is the global leader providing reliable interoperability, validation, and migration solutions for product data and related systems. Our customers recognize the value in having a trusted solution partner that provides more than just software. ITI solves complex product data interoperability problems so that the world's leading manufacturers can focus on making great products. You need to keep your engineering initiatives moving forward.

View all of our case studies at [iti-global.com/customer-success](http://iti-global.com/customer-success)

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Dr Chouikhi explains, "We need to look into a microwave to see what is really happening. What if the shape of the packaging or the product layout was changed, how would the product reheat? CADfix has a hugely important role to play in this process."

ProEng uses infrared thermal imaging, as well as conventional thermocouples, to measure temperatures around the product during and after heating. This visually demonstrates what is happening to the food inside the microwave as it is being heated.

In parallel with the experimental evaluation, ProEng uses CADfix to generate geometric models of the product inside a range of microwave ovens. This process involves writing macros to generate the oven geometries and the product geometry. These macros enable a wide range of alternative product shapes and configurations to be generated and placed at various positions in the ovens.

Next, the meshes are used to perform electromagnetic and thermal simulations using software currently being developed in a joint collaboration between ProEng Solutions and a modeling group at a French University.

The results of the simulations are analyzed, and data is visualized using the post-processing capabilities available in CADfix. This allows ProEng to prepare movies of coupled power and temperature profiles for use in presentations to client companies.

The combination of experimental and simulation data allows ProEng to develop and propose solutions about how to improve their clients' product reheat performance. ProEng Solutions also uses its simulation capabilities and its capabilities to alter the

microwave properties of foods to design solutions that give differential heating and produce crisping of such products as pizza bases and spring rolls.

Dr Chouikhi explains, "We're currently looking at a ready-meal concept that includes sauce and rice on one side and spring rolls on the other. The requirement is to reheat these two sides simultaneously and to end up with suitably heated sauce and rice and hot and crisp spring rolls. We are currently exploring a number of packaging and material options using simulations and experiments in an attempt to develop a suitable and commercially viable solution that will allow the meal combination to be microwaved all at once. This will save time and make the product more convenient for the consumer."

## Conclusion

With such a huge market for ready-meal products, it is important for companies to get the production process right. Through the work that ProEng carries out, companies gain a much greater understanding of how to develop tastier, healthier and more efficient microwave meals. CADfix's role in this process is vital to providing an important technical analysis on this entire development process.

Dr Chouikhi concludes, "CADfix has proved to be such a vital tool in our research and analysis of microwave meals. We have come to realize that this software package is essential in providing us with the simulation capability necessary in our projects and in allowing us to effectively communicate the results of our analysis to our client companies."